
APPLICATION FOR PATENT

of

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for

**NOVELTY ARTICLES FOR FAMOUS PERSONS
AND
METHOD FOR MAKING SAME**

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1
2 RELATED APPLICATIONS

3 This application claims the benefit of U.S. Provisional Application No.
4 60/446,478 filed February 10, 2003.

5 BACKGROUND

6 The present invention relates to novelty articles for famous persons and a
7 method of making same. Whether called a collectable, memorabilia, souvenir,
8 promotional product, toy, or the like, the public finds novelty articles extremely
9 popular. Novelty articles have taken a variety of forms and are used in connection
10 with a wide variety of personas. For instance, novelty articles are produced in
11 connection with a variety of living or deceased famous persons, including, for
12 example, celebrities, athletic stars, actors and actresses, musicians and composers,
13 politicians and other leaders, historical figures, and the like. No one, however, has
14 previously made a novelty article for famous persons in accordance with the present
15 invention.

16
17 BRIEF SUMMARY OF THE INVENTION

18 One example of the invention is a method for creating a novelty article. A
19 three-dimensional digital model of a face of a famous person is obtained. A three-
20 dimensional digital model of an article associated with the fame of the famous
21 person is obtained. The digital models are merged to create a merged three-
22 dimensional digital model, wherein the face of the famous person is positioned on
23 the article of fame in the merged three-dimensional digital model. A physical three-
24 dimensional novelty article is created based on the merged three-dimensional digital
25 model.

26 Another example of the present invention is a sports novelty article relating to
27 a famous athlete. The article comprises a three-dimensional representation of a ball
28 associated with the sport from which the famous athlete is associated. The article
29 also comprises a three-dimensional representation of the face of the famous athlete,
30 the representation of the face being positioned on the representation of the ball.
31 Optionally, the ball continues from the face to form the remainder of the athlete's
32 head such that the relative size of the representation of the ball and the
33 representation of the face is such that the ball is generally the size of the
34 representation of the athlete's head.

1 The foregoing brief description of certain examples of the invention should not
2 be used to limit the scope of the present invention. Other examples, features,
3 aspects, embodiments, and advantages of the invention will become apparent to
4 those skilled in the art from the following description, which is by way of illustration,
5 one of the best modes contemplated for carrying out the invention. As will be
6 realized, the invention is capable of other different and obvious aspects, all without
7 departing from the invention. Accordingly, the drawings and descriptions should be
8 regarded as illustrative in nature and not restrictive.

10 BRIEF DESCRIPTION OF DRAWINGS

11 While the specification concludes with claims which particularly point out and
12 distinctly claim the invention, it is believed the present invention will be better
13 understood from the following description taken in conjunction with the
14 accompanying drawings, in which like reference numerals identify the same
15 elements and in which:

16 Fig. 1 illustrates an example of a novelty article combining the face of a
17 famous person with an article associated with the fame of the famous person;

18 Fig. 2 illustrates an example of a novelty article combining the face of a
19 famous person with an article associated with the fame of the famous person;

20 Fig. 3 illustrates an example of a novelty article combining the face of a
21 famous person with an article associated with the fame of the famous person;

22 Fig. 4 illustrates an example of a novelty article combining the face of a
23 famous person with an article associated with the fame of the famous person; and

24 Fig. 5 is a flowchart of an illustrative method for creating a novelty article.

26 DETAILED DESCRIPTION

27 Fig. 1 illustrates an example of a novelty article (10). A three-dimensional
28 representation of the face of a famous person (14), in this case a famous baseball
29 player, is positioned on a three-dimensional representation of an article associated
30 with the fame of the person (the "article of fame") (12), in this case a baseball. In
31 addition to the famous person's face (14), the novelty article (10) can include other
32 features associated with the likeness of the famous person, such as a hat, hair,
33 glasses, masks, and the like. For instance, the present example includes the bill of
34 the baseball hat (16). In addition, a base (not shown) can be integrally formed with

1 the novelty article (10) so it could be free-standing. Optionally, the novelty article can
2 include various insignia, whether three-dimensional or printed, related to the famous
3 person. For instance, the novelty article (10) shown in Fig. 1 could include the
4 player's name, team logo, and/or jersey number, such as on the ball portion (12), on
5 a base, on a tag, or elsewhere.

6 The novelty article can be made from a variety of materials, including, for
7 example, foam, plastic, rubber, metal, stone, ceramic, resin, candy, soap, and the
8 like. The novelty article can be a uniform color or multi-colored, with the facial
9 features and article of fame having true tones or artificial tones. The size of the
10 novelty article can vary widely. For instance, the novelty article could be
11 proportionate to the actual head size of the famous person, could be reduced in size
12 such that the novelty article is a handheld item or smaller, or could be an enlarged to
13 be bigger than the famous person's head. As shown in the example of Fig. 1, the ball
14 portion (12) of the novelty article (10) is reproduced in actual size while the face
15 portion (14) is reduced in size to fit on the ball (12).

16 The face portion (14) of the novelty article (10) of Fig. 1 is a generally realistic
17 likeness of the famous person; however, the facial expression can be varied or
18 exaggerated or be a caricature or cartoon-like rendering. In one variation, the face of
19 the famous person is textured similar to the texture of the article of fame. For
20 instance, in the case of a baseball star, the stitching on the baseball could extend
21 onto the face of the baseball star. As a further example, in the case of a soccer star,
22 the checked pattern of the soccer ball could continue onto the face of the soccer
23 star. In another variation, the geometry of the facial features could be modified to
24 mimic the shape of the article of fame.

25 As shown in Fig. 1, the baseball player's face (14) is positioned on the ball
26 (12) such that the ball continues from the face (14) to form the remainder of the
27 baseball player's head. As shown in the present example, the relative size of the ball
28 (12) and the face (14) is such that the ball (12) is generally the size of the player's
29 head. While the size and shape of the ball will rarely, if ever, be the exact size and
30 shape of an athlete's head, "generally the size" can be defined within the following
31 mathematical range:

$$V_B/2 \leq V_H - V_F \leq V_B$$

wherein,

V_B = volume of the ball prior to combining with the face;

V_H = volume of the head prior to combining with the ball; and

V_F = volume of the face (i.e., the portion of the head volume, V_H , outside the volume of the ball, V_B , in the combined novelty article).

If V_B and V_H are not precisely known, their values can be estimated by projecting the surfaces of the ball and face, respectively, to generate approximate volumes. It should be recognized that the foregoing range is merely illustrative and that a novelty article may be made outside such range. While the foregoing volumetric range is illustrated using a ball, it will be readily understood to one with ordinary skill in the art that similar calculations may be made using any article of fame, sports related or otherwise.

Optionally, the novelty article may include voice signal technology. This may include one or more recorded audio signals capable of playback. The recorded audio may include messages, sounds, music or other audio content related to the famous person. For instance, the baseball player represented in Fig. 1 could record a variety of unique phrases, whether inspirational, humorous or otherwise. The voice signal technology may also include speech recognition functionality so the novelty article is interactive.

The novelty article can be solid or hollow. If hollow, the novelty article can optionally be openable to reveal a cavity. The cavity could be very small or large enough to function, for instance, as a toy chest. Optionally, the novelty article could be distributed with a removable item positioned in the cavity, such as a bounce ball, toy, car, miniatures, candy, stickers, trading cards, action figures, and the like. If the cavity is openable, it could also closeable using a variety of closing mechanisms known in the art, such as, for example, snaps, zippers, fasteners, closures, interference fits, barbs, and the like. Further, when opened the novelty article could form two or more pieces, which may be separable or attached to one another, such as by a hinge. In one embodiment, the novelty article is made from an elastomeric material and is openable and reversible to reveal a second face. For instance, if a famous athlete plays more than one sport, the first face and article of fame could be associated with the first sport, while the second reversible face and article of fame

1 could be associated with the second sport. As another example, the first face could
2 be a likeness, while the second reversible face could be a caricature.

3 As shown in the example of Fig 1, the representations of the face (14) and
4 article of fame (12) are proportional to the respective objects in all three dimensions.
5 It is contemplated, however, the representations of the face and/or article could be
6 disproportionate in one or more of the three dimensions. For instance, the face could
7 be flattened similar to the embossing on a coin, but nevertheless retain a three-
8 dimensional quality. Similarly, the article of fame may be flattened. In one
9 embodiment, the face and article of fame are both flattened. Accordingly, the
10 flattened novelty article can take the form of a coin, sticker, magnet or the like.
11 Alternatively, the flattened novelty article can be combined with other articles,
12 such as jewelry, hats, pillows, backpacks, and the like.

13 The three-dimensional combined face and article of fame, whether
14 proportional or disproportionate, can be used as a novelty article by itself; however, it
15 can also be included on clothing, including, for example, on hats, shoes, shirts,
16 pants, and the like. The combined face and article of fame can also be included on
17 other soft items, including, for example, on backpack, pillows, and the like. In
18 addition, the combined face and article of fame can be included on jewelry, including,
19 for example, belt buckles, ear rings, bracelet, rings, watches, and the like. The
20 combined face and article of fame can also be included on utilitarian articles, either
21 as an adornment or integrated with a variety of other articles, including, for example,
22 on pens on pencils, key chains, car mirror dangles, Christmas tree ornaments, candy
23 dispensers, furniture accents, knobs, utensils, plates, straws, computer mouse,
24 lamp, clock, and the like. If the combined face and article of fame is hollow, it can
25 also be used as a coffee mugs, water bottle, thermos and the like, or openable in the
26 form of a lunch box, bank, toy chest and the like. The foregoing should serve merely
27 as examples and are not limiting to the variations contemplated by the inventor.

28 While the example in Fig. 1 combines a sports star with a sports ball, it should
29 be recognized that the novelty article can be made combining the face of any famous
30 person with any article associated with the fame of the person. For instance, the face
31 can be combined with an object of play related to a sport, including, for example,
32 soccer balls, baseballs, footballs, rugby balls, hockey pucks, golf balls, volleyballs,
33 tennis balls, bowling balls, billiard balls, throwing discs, boxing glove, and the like.
34 The face can be combined with other objects related to the sport, including, for

1 example, golf clubs, lacrosse sticks, tennis rackets, baseball bats, hockey sticks,
2 paddles, skate boards, surf boards, and the like. The face can also be combined with
3 motorized objects, including, for example, motorcycles, race cars, and the like. In
4 addition, the face can be combined with venues related to a sport, including, for
5 example, wrestling rings, stadiums, and the like. The face can also be combined with
6 trophy objects related to a sport, including, for example, wrestling title belts or
7 buckles, trophies, cups, and the like. Beyond sports, the famous person and/or the
8 article of fame could be unrelated to sports. For instance, the face of a famous rock
9 and roll star can be combined with the body of the star's guitar or a microphone, the
10 President's face can be combined with the White House, and the like. The foregoing
11 should serve merely as examples and are not limiting to the variations contemplated
12 by the inventor.

13 Fig. 2 illustrates another example of a novelty article (20) comprising a three-
14 dimensional representation of the face of a famous person (24), in this case a
15 famous football player, is positioned on a three-dimensional representation of an
16 article associated with the fame of the person (22), in this case a football. The
17 novelty article (20) in the present embodiment includes a decorative stand (26),
18 which may be fixed or separable from the combined face (24) and article of fame
19 (22). In the present example, the stand (26) takes the form of the home stadium of
20 the football player's team; however, a wide variety of variations may also be used,
21 such as, for example, a wrestling ring, tennis court, hockey goal, baseball mitt,
22 kicking tee, pitcher's mound, racket, and the like. The stands may be sold or
23 otherwise provided separately. Further, consumers may be able to choose between
24 a range of different stands. In another embodiment, a given stand could hold multiple
25 novelty articles, so, for instance, several players from the same team could be
26 collected and displayed together.

27 Fig. 3 illustrates another example of a novelty article (30) comprising a three-
28 dimensional representation of the face of a famous person (34), in this case a
29 famous baseball player, is positioned on a three-dimensional representation of an
30 article associated with the fame of the person (32), in this case a baseball. In the
31 present example, the face (34) is distorted to mimic the roundness of the baseball
32 (32). In particular, the face (34) is rounded as if the facial features, ears and hair
33 were merging out of the ball (32). The color of the textured or modified face may be
34 the flesh color of the famous person, the color of the article of fame, or an altogether

1 different color. The example of Fig. 3 further includes a separate stand (36), in the
2 form of a baseball mitt, to hold the novelty article (30). Further, stand (36) is
3 supported by a base (38), which includes a plate (39) with identifying information,
4 such as the player's name, team, number, and the like.

5 Fig. 4 illustrates another example of novelty article (40) comprising a three-
6 dimensional representation of the face of a famous person, in this case a famous
7 basketball player, is positioned on a three-dimensional representation of an article
8 associated with the fame of the person, in this case a basketball. The combined face
9 and article of fame (42) of the present example is positioned as the head of a figurine
10 (44). Here the figurine (44) is wearing the uniform of the team on which the player
11 plays. The figurine (44) may be static or opposable. In the present embodiment, the
12 combined face and article of fame (44) is hollow and contains a plurality of
13 interlocking segments from which the figurine (44) may be assembled. As illustrated
14 here, the right side of the figurine (44) is an assembled arrangement while three right
15 side is an exploded arrangement. In addition, a proportionally sized head (48) is also
16 provided, which may be interchanged with the combined face and article of fame
17 (42).

18 Fig. 5 illustrates an example of a method (50) for creating a novelty article. At
19 steps (51) and (52), a three-dimensional digital model of a face of a famous person
20 and three-dimensional digital model of an article of fame is obtained, respectively.
21 The act of obtaining could be achieved in a variety of ways, including, without
22 limitation, scanning, downloading a file, graphically generating a file, and the like.
23 During step (53), the digital models (51, 52) are merged to create a merged three-
24 dimensional digital model (54) wherein the face of the famous person positioned on
25 the article of fame. Optional step (55) involves modifying the merged model (54),
26 such as, for example, colorizing, texturing, adding or deleting features, or otherwise
27 changing the merged model. A mold is then created during step (56) based on the
28 merged model (54), whether modified or unmodified. Once a mold is created, the
29 novelty articles can then be produced during step (57). Accordingly, the foregoing
30 illustrates one technique for creating a physical three-dimensional novelty article
31 based on the merged digital model.

1 EXAMPLE 1:

2 This example starts with the Head & Face Color 3D Scanner Model
3 3030RGB/PS made by Cyberware. The Model 3030 is an advanced, general-
4 purpose implementation of Cyberware's 3D digitizing technology. The 3030
5 incorporate a rugged, self-contained optical range-finding system, whose dynamic
6 range accommodates varying lighting conditions and surface properties. Entirely
7 software controlled, the 3030 requires no user adjustments in normal use. In
8 operation, the 3030 emits a safe, low intensity laser on an object to create a lighted
9 profile. A high-quality video sensor captures this profile from two viewpoints. The
10 system can digitize thousands of these profiles in a few seconds to capture the
11 shape of the entire object. Simultaneously, a second video sensor in the 3030
12 acquires color information.

13 The scanning process captures an array of digitized points, with each point
14 represented by x, y, and z coordinates for shape and 24-bit RGB coordinates for
15 color. The 3030 transfers this data via a SCSI interface to a graphics workstation for
16 immediate viewing and modification. Color information in 3D digitizing makes
17 available nearly all the information a graphics application needs to fully describe an
18 object. In addition to enhancing realism in graphic models, color denotes boundaries
19 that are not obvious from shape alone. Color indicates surface texture and
20 reflectance. And by marking an object's surface before digitizing, one can use color
21 to transfer ideas from the object to the graphic model.

22 In specialized applications, color can reveal characteristics such as skin
23 discoloration, the locations of landmarks, or other features. Working in the infrared
24 region, a customized color subsystem could even detect surface temperature. The
25 PS motion system is designed to scan the head and face of live subjects quickly,
26 comfortably, and safely. Because the system moves the digitizer while the subject
27 remains stationary, the PS works well in many applications involving subjects that
28 are inconvenient to move during digitizing.

29 The PS platform is popular for use in medical applications, such as
30 reconstructive and/or plastic surgery and burn mask design. Similarly, designers of
31 products such as helmets, which must fit the human head closely, find the PS motion
32 system ideal. It also serves well for personal portrait sculpture, which the athletes
33 head is digitized, then reproduced on an automated milling machine or rapid
34 prototyping system with remarkable fidelity.

1 The PS motion system has only one manual adjustment (the scan head
2 height) and is otherwise completely controlled by software running on a graphics
3 workstation. Cyberware software provides specific features for controlling the PS.
4 The Head & Face Color 3D Scanner Bundle also includes the CySurf software that
5 provides a means for converting scan data into a NURBS surface.

6 Software gives the user total control of the 3030 operating on a graphics
7 workstation. Software tools available from Cyberware allow the user to manipulate
8 and analyze the 3D models in a variety of ways. The user can automatically measure
9 attributes such as area and volume. The user can edit models with operations such
10 as clipping, scaling, and image cut and paste. One can also use popular third-party
11 programs to work with the 3D models. Cyberware supplies translation tools that
12 convert the scanner's data array to a form readable by most third-party programs.
13 The Cyberware data format is in the public domain, so it is possible to create special-
14 purpose translation routines.

15 In the present example, the 3030 Scanhead is used to scan the athlete's head
16 and the 3030 Motion System is used to scan the article of fame. Once the scans of
17 the face and article of fame are produced it will go to the next phase which is taking
18 the data into software allowing the three-dimensional scans to be surfaced, modeled,
19 image morphing, and merging of files can be created to form one object.

20 Cyberware CySlice v3 features the new subdivision surfaces (SUBD) fitting
21 tool, SUBDS are becoming widely accepted in the CGI community as an alternative
22 to NURBS. CySlice v3 allows users to fit SUBD surfaces to dense polymeshes, and
23 as with the NURBS fitting tools, color and bump/normal/displacement maps can then
24 be calculated. Surfacing CySlice retains all of the capabilities of version 2, so the
25 user can easily generate IGES 128 NURBS surfaces from any Ply file. Cyberware
26 also provides translators to convert STL (Stereo Lithography) and OBJ (Alias I
27 Wavefront) files to the Ply file format, opening up CySlice to users who do not
28 necessarily use a Cyberware Rapid 3D Digitizer. The software allows the user to
29 create NURBS surfaces in a free-form manner. Also the user can manipulate any
30 portion of the surface at any time; UV density can be altered, boundary curves can
31 be modified by moving existing control and end points, or by adding or subtracting
32 control points.

33 CySlice also allows the user to save a template surface; this feature allows
34 the user to define a template for an object that contains all of the control points,

1 boundary curves, and surface parameters. This template can then be applied to any
2 similar object so that the user need to create a surface only one time, apply that
3 surface to subsequent models, thus saving many hours of user interaction.

4 CySlice is used to extract polylines and splines from polygonal meshes.
5 These polylines or splines can then be imported into modeling software as an aid to
6 the construction of spline surfaces. You can either cut a whole lot of equally spaced
7 parallel sections through the polygonal mesh, or draw individual slice lines along key
8 features. These slices can then be edited for consistent start points and direction.
9 And finally the slice lines can be interpolated with reduced vertex count polylines
10 (IGES 106), or with NURBS splines (IGES 126).

11 While other software could be used in place of CySlice v3, the following lists
12 the major features of CySlice v3:

- 13 - Remove Junk: Delete unwanted faces.
- 14 - Fill Holes: Fill all holes automatically, or step through them one at a time for
15 filling.
- 16 - Selective Smoothing: Interactively smooth regions with the smooth brush.
- 17 - Selective Decimation: Adaptively reduce all faces or just those in selected
18 regions networks
- 19 - Shape Points: The building block. Place, and then move them over the
20 polymesh in real time.
- 21 - Boundary Curves: Simply connect shape points to create boundary curves.
- 22 - NURBS/SUBD Patches: Fill any bounded region with a patch fits to polymesh.
- 23 - Always Tangent: Can be toggled off/on for individual boundaries.
- 24 - Active Networks: Move a shape point, curves update, affected patches are
25 refitted.
- 26 - Multi-resolution: Quickly define simple networks, and then output detailed
27 surfaces.
- 28 - Mirroring: Build a network on half an object, and then mirror it to complete the
29 surface.
- 30 - Templates: Copy networks between similar shaped objects. Produce clean
31 morph targets.
- 32 - Stitching: Join smaller patches together. Make single patch heads.
- 33 - Texture Maps: Extract color and displacement maps. Lightweight surfaces,
34 detailed render.

- 1 - Shaders Definitions: Automatic generation of shaders for each patch. Hassle-free mapping.
- 2
- 3 - Import NURBS Patches: Texture map tools work just as well with NURBS
- 4 patches from other applications.
- 5 - Import SUBD Surfaces: Texture map tools also work with subdivision surfaces
- 6 imported from other applications.
- 7 - NURBS/SUBDS/Polymeshes: Output NURBS patches, SUBD surfaces or
- 8 quad polymeshes.
- 9 - RIB Export & Render: Provides a link to your renderer for quick evaluation of
- 10 mapped surfaces.
- 11 - Multi-Platform: Intel Windows NT/2000, and SGI IRIX 6.3+.
- 12 - Optimized: Interactive, even with very detailed polymeshes.
- 13 - Efficient: Low RAM impact. Run your modeling/animation applications at the
- 14 same time.

15 The athlete sits in the scanning apparatus as a laser passes around their
16 head. The laser works with computers to develop a three dimensional 'map' of the
17 athletes head, with varying elevations to make up the features that make us all
18 unique. The same process will take place for the article of fame only on a platform
19 motion system scanner. This information is kept in the computers and is used by
20 modeling programs to reconstruct the image. This reconstruction can be done
21 digitally on the computer, to render an image that can be rotated and scaled, or it
22 can be sent along to the next phase of the process - producing a hard copy.

23 After a successful scan, one way of producing an actual physical
24 representation from the computer data uses stereo-lithography. This can also be
25 done to the digital image data for a CGI character. The first copy is produced in wax
26 and can be sized by the prototyping machine to whatever scale is needed. After
27 producing a highly detailed copy of the scanned athlete you'd think the process
28 would be complete, but that's just the beginning. After the computer has taken its
29 shot, it's time to add the human touch. Computers can make very accurate copies,
30 but they just aren't able to add that spark that brings things to life, and this is where
31 the sculptors come into the picture. Far from being a replacement for sculptors, the
32 scans are just a tool to give the artists a base upon which to work. The sculptors at
33 then make changes to the hard copies to make the likeness better. Computer
34 scanning also captures color. The digital color information will be printed out to assist

1 the in house painters to get the job done. Painters can get the skin tones perfect,
2 add some shading and establish just the right look for hair or eyes. After the paint
3 has been applied the finished prototype is sent on for approval.

4 The majority of the first stage models can be produce from Thermojet 3D Wax
5 Printer. The machines may be called printers but they actually crank out full-blown
6 wax sculpts with the most exact details from the surface scan data. The wax printer
7 gets the data and starts from the bottom up. It lays down a hot, paper-thin layer of
8 wax, and then cools. The next layer goes down hot, and it builds' up in that manner.
9 After a while, you get an exact sculpt based on the and when done the sculptors get
10 to tweak, and detail. Another 3D printer used is the Z Corporation - Post Process
11 ZW4 Automated Waxer. The ZW4 Automated Waxer is an accessory used in
12 conjunction with the Z Corporation. Three-Dimensional Printer. The ZW4 Waxer
13 allows the user to infiltrate printed parts with paraffin wax to enhance strength,
14 provide uniform part finish and color, or to create patterns suitable for investment
15 casting. A third machine used is the Z Corporation - Z406 System, this system is a
16 premium 3D Printer with the capability of printing in full-color, communicating
17 important information about parts, including engineering data, labeling, highlighting
18 and appearance simulation. The System is fast, convenient and easy to operate,
19 allowing you to accelerate the design process and get your products to market
20 ahead of the competition. Z Corporation offers a variety of materials for use with the
21 Z406 System. You can use parts directly or infiltrate them to serve a wide range of
22 modeling needs, all at an affordable price. Quick access to full-color concept models
23 allows or engineers to accurately communicate design ideas.

24 Z Corporation's proprietary System Software accepts solid models in STL,
25 PLY, VRML (WRL) and SFX file formats as input. Z Corporation's proprietary System
26 Software accepts solid models in STL file format as input for monochrome parts and
27 VRML, ZCP, PLY and SFX file formats as input for full color parts. System Software
28 runs on Microsoft Windows 2000 and NT. Z Corporation - Z810 System is also used
29 for to create a novelty article when a larger model is required. This system is a fast
30 and inexpensive way to create large appearance prototypes for design review, mock-
31 ups for form and fit testing, and patterns for casting applications. The large build
32 volume allows you to print full-scale concept models for more effective
33 communication with marketing, manufacturing, customers and suppliers. The Z810
34 System's color capability allows accurate representation of designs including FEA

1 and other engineering data, further enhancing communication. Physical models can
2 be created in plaster or starch-based materials and can be infiltrated to produce
3 parts with a variety of material properties, satisfying a wide spectrum of modeling
4 needs.

5 The Build Process involves:

- 6 1. The Printer spreads a layer of powder from the feed box to cover the surface
7 of the build piston.
- 8 2. The Printer then prints binder solution onto the loose powder, forming the first
9 cross-section. Where the binder is printed, the powder is glued together. The
10 remaining powder is loose and supports the part as it is being printed.
- 11 3. When the cross-section is complete, the build piston is lowered slightly, and a
12 new layer of powder is spread over its surface. The process is repeated until
13 the build is complete.
- 14 4. The build piston is raised and the loose powder is vacuumed away, revealing
15 the completed part.

16 The Post Processing can include infiltrating the finished part with various
17 materials to improve its strength and durability. For a quick design review, parts can
18 be left raw or "green". To quickly produce a more robust model, parts can be dipped
19 in wax. For a robust model that can be sanded and painted, the part can be
20 infiltrated with a resin or urethane. Some of the advantages include:

- 21 - It is a fast 3D Printer.
- 22 - Each layer is printed in seconds, reducing the time it takes to print a hand-
23 held part to 1-2 hours.
- 24 - Z Corporation's color 3D Printers can create parts from a full 24-bit palette of
25 colors, resulting in multiple color prototypes. This functionality gives designers
26 the data they need to create and collaborate more effectively throughout the
27 design process.
- 28 - Versatility in every step of the design process for design and reviewing the
29 models before manufacturing and molding as well as functional testing. The
30 option of infiltrating parts offers the opportunity to produce parts with a variety
31 of material properties to serve a range of modeling needs.

32 After the artist has put all of his finishing touches into the models of the
33 novelty article and all parties have approved them is time for molding. Depending on

1 the final process roto-casting, injection molding, or blow molding. A final mold with all
2 the proper legal line needs to be produced.

3 One popular process will be done with a CNC 5-Axis machine, making the
4 tool out of aluminum. Another new technology form is using a ZCast Direct Metal
5 Casting. The ZCast Direct Metal Casting process provides the ability to produce cast
6 metal parts from a CAD file significantly faster and less expensively than traditional
7 prototype casting methods. The process involves printing molds and cores on a 3D
8 Printer directly from digital data, eliminating the pattern and core box production step
9 in the traditional sand casting process. Metal is then poured into the 3D printed
10 molds. The technology allows engineers to prototype parts in metal that were
11 previously cost and time prohibitive. Z Corporation's 406 Color 3D Printer and Z810
12 Large Format 3D Printer are optimized for use with ZCast materials.

13 Now that all the tools have been made its time for the manufacturing.
14 Preferably, a design manufacturer is selected that specializes in roto-casting,
15 electronic and digital voice recording products, specializing in industrial grade
16 precision injection molding plastic products; and computer related electronic
17 products including PCB assembly and testing. Some advantages for roto-casting,
18 plastic injection, and blow molding are;

- 19 - The wide selection of materials available such as rubber, urethane, latex,
20 silicone, plastics all in rigid form or extremely stretchable.
- 21 - The end product is essentially stress-free
- 22 - The molds are relatively inexpensive
- 23 - The lead time for the manufacture of a mold is relatively short
- 24 - Short production runs can be economically viable
- 25 - There is no material wastage in that the full charge of material is normally
26 consumed in making the part
- 27 - It is possible to make multilayer products
- 28 - Different types of product can be molded together on the one machine
- 29 - Inserts are relatively easy to mold in
- 30 - High quality graphics can be molded in

31 32 EXAMPLE 2

33 The following is an example of a process for creating an novelty article.

- 1 1. Concepting and selecting the article of fame to be used and the
2 product to be developed.
- 3 2. Product design development and turnarounds showing multiple views
4 of novelty articles to be produced.
- 5 3. Three-dimensional scan of the head and face of the athlete with color
6 3D scanner model 3030.
- 7 4. Three-dimensional scan of a sport article related to the athlete with
8 color 3D scanner model 3030 motion platform scanner.
- 9 5. Another form of scanning from sports article in some cases will be
10 SCS, Touch Probe Laser Scanner, or Clowd Points.
- 11 6. Transfer scan images to compare change to different format depending
12 on application to be produced.
- 13 7. Surface data development scan can now also be used as digital image
14 data for CGI character. Convert data to NURBS using CySurf Imageware Surfacar
15 Catia Alias Wavefront.
- 16 8. Take surfaced data of all scans and use CySlice for merging and
17 morphing objects together IGES 128Nurbs EGES126 Splines Cyberware Ply (for
18 subdivision/surfaces and polymeshes).
- 19 9. Additional design software to be used depending on product
20 application, including STL, Alias Wave front, IGB 128, Imageware surfacer, OBJ,
21 AutoCad 13, Autosketch, Tiffimage Files, and the like.
- 22 10. Additional design stage, using systems such as UNIX Silicon Graphics,
23 UNIX IBM, PC IBM.
- 24 11. Final product design ready and can be out putted in Echo, Ply, 3D
25 Studio, OBJ, STL, ASCII, DXF (3D Faces), DFX, IGES 106 110 112 124, VRML,
26 IGES 128 Nurbs, Inventor, Digital Arts (SGI), MOVIE, BYU (SGI), SCR (MESH &
27 SLICO) SGI.
- 28 12. 3D output for concept models to various machines depending on
29 application.
- 30 13. ZCorporation WH automated waxer three dimensional printer or 3D
31 thermoset wax printer generated from 3D files.
- 32 14. A plastic model stereolithography plastic model ZCorporation Z406 or
33 Z810 system for 3D print out physical plaster models.

1 15. Molding 3D printout models in silicone rubber in order to pour workable
2 clay wax for final sculpt modeling.

3 16. Final modeling and sculpting to the wax is necessary to prepare for
4 tooling.

5 17. Sport licenser such as NFL, MLB, NHL, or NBA, as well as athlete is to
6 approve the final model before going to tooling.

7 18. Rescan approved model for product tooling design in Surfcam Master
8 Cam or Cimatron.

9 19. Tool making for plastic, rubber, latex, silicone and urethane parts.

10 20. Make casting, such as ZCast direct metal casting, CNC 5Axis machine,
11 legal line on every tool etched in, Pro/Engineer CAD/CAM system, Euclid Styler
12 (previous Strim 100 CAD system), Sodilk EDM machine, Renishaw Cyclone digitizer.

13 21. Rotocast in rubber and vinyl stamping machines; or

14 22. Plastic injection; or

15 23. Blow molding.

16 24. Full SMT assembly and insert of voice signal technology and
17 microrecorder software, such as FUJI high speed chip placer CP6-400, electrovert
18 omniflo7, electrovert econopak, or dualwave solder system.

19 25. Insert of fastener and final assembly of both 3D faces and skins of
20 sport article, such as die bonding process, auto insertion for conventional
21 components, wave soldering process, dip soldering process.

22 26. Final works like and look like models and paint master ready for final
23 inspection from sport licenser and athlete intervention testing.

24 27. Exploded view drawing and controls tooling shots of final approved
25 product photo shoot and contract samples.

26 28. Mass production begins.

27 29. Packaging, insert, decals and polybags, and shipping.

28 30. Distribution to stores around the world.

29 Having shown and described various embodiments of the present invention,
30 further adaptations of the methods and systems described herein can be
31 accomplished by appropriate modifications by one of ordinary skill in the art without
32 departing from the scope of the present invention. Several of such potential
33 modifications have been mentioned, and others will be apparent to those skilled in
34 the art. For instance, the present teaching are not limited to athletes and could be

1 applied with any famous person and any article of fame. Accordingly, the scope of
2 the present invention should be considered in terms of the following claims and is
3 understood not to be limited to the details of structure and operation shown and
4 described in the specification and drawings.